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Supporting Information

Direct Hydrogenation of Dinitrogen and Dioxygen via Eley–Rideal Reactions

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anie_201604899_sm_miscellaneous_information.pdf

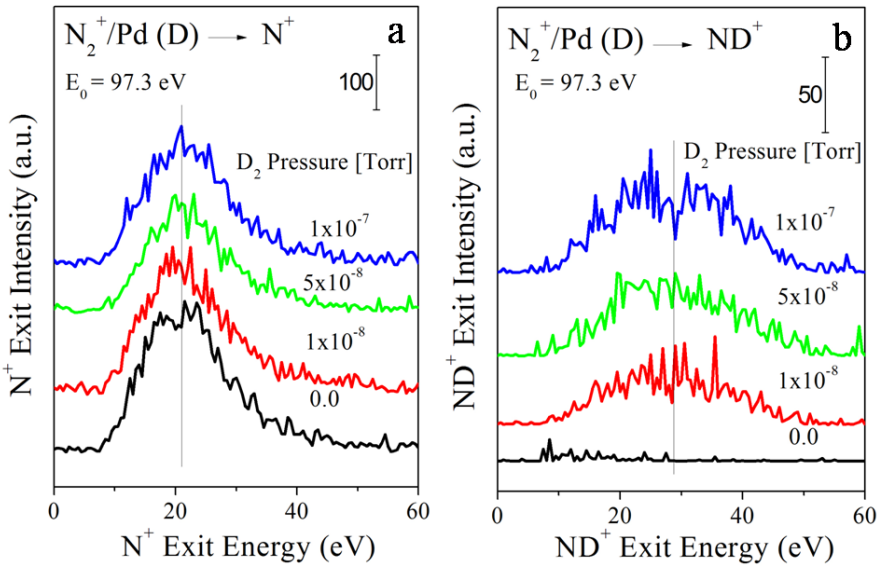

Figure S1. Energy distributions for (a) N^+ and (b) ND^+ ion exits from N_2^+/Pd(D) at E_0=97.3 eV as a function of the D_2 background pressure. These products are mostly due to sputtering of trapped fragments on the surface.

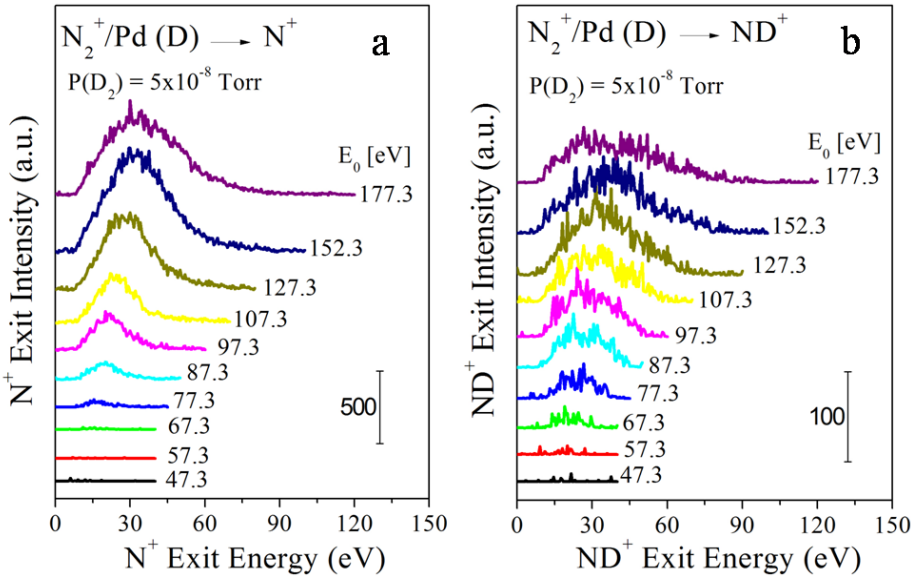

Figure S2. Energy distributions for: (a) N^+ and (b) ND^+ ion exits from N_2^+/Pd(D) as a function of the N_2^+ incidence energy, in a background of 5×10^{-8} Torr D_2.

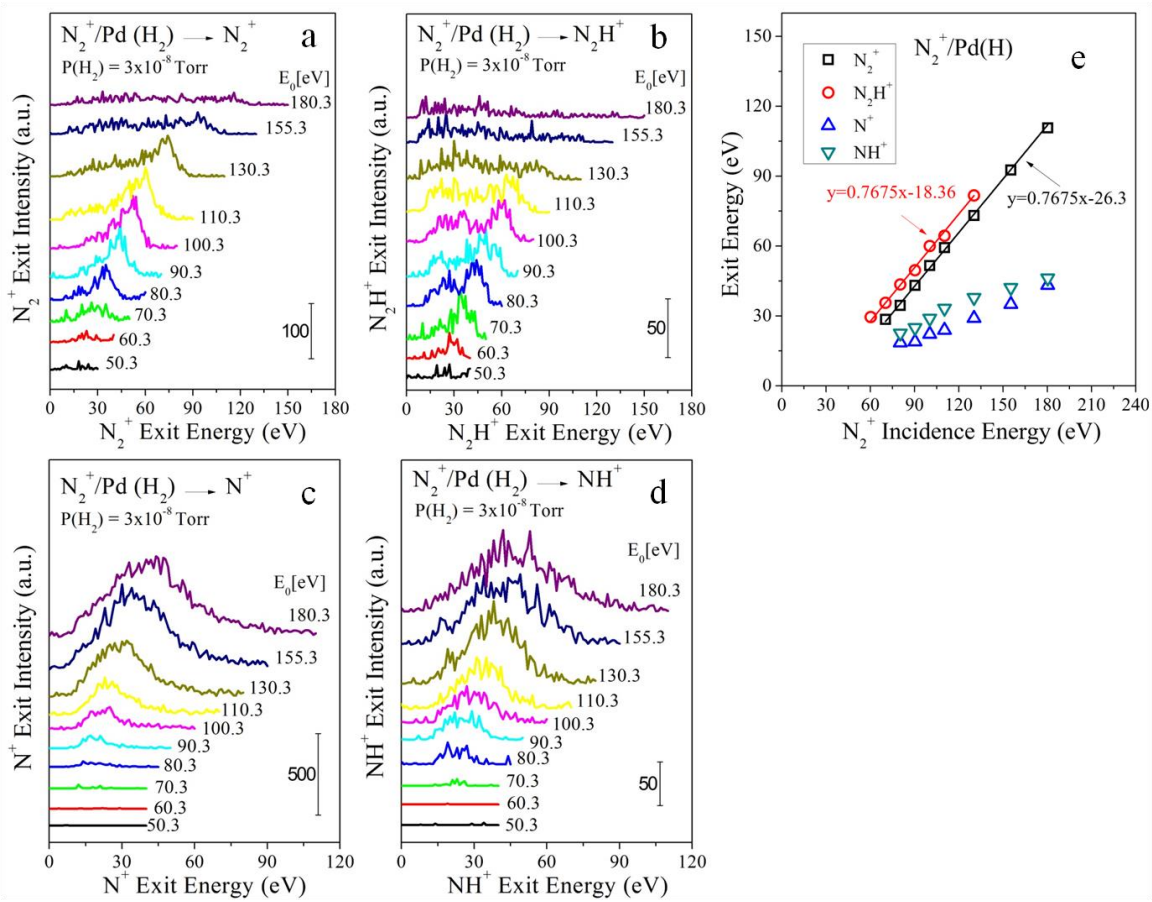

Figure S3. Energy distributions for: (a) N_2^+, (b) N_2H^+, (c) N^+ and (d) NH^+ ion exits from N_2^+/Pd(H) as a function of the N_2^+ incidence energy, in a background of 3×10^{-8} Torr H_2. (e) Peak exit energies of N_2^+, N_2H^+, N^+ and NH^+ as a function of N_2^+ incident energy. The solid lines are linear fittings with the slope K=0.7675 from the calculated kinematic factor for N_2^+ scattering on Pd.

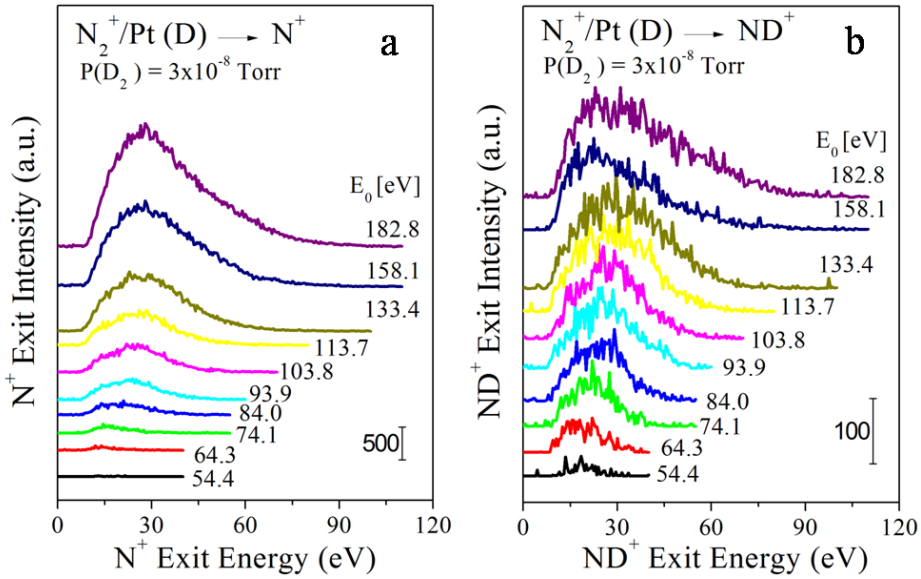

Figure S4. Energy distributions for: (a) N^+ and (b) ND^+ ion exits from N_2^+/Pt(D) as a function of the N_2^+ incidence energy, in a background of 3×10^{-8} Torr D_2.

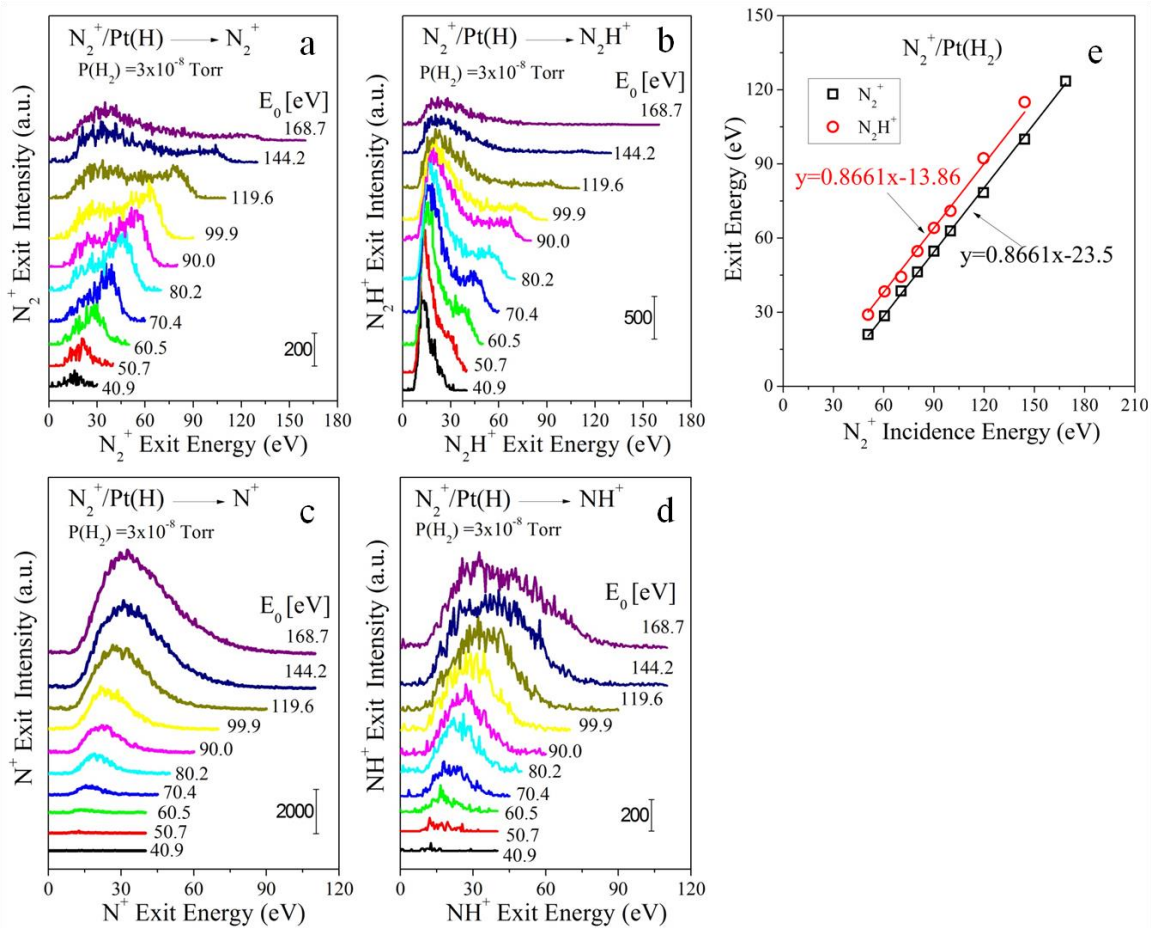

Figure S5. Energy distributions for: (a) N_2^+, (b) N_2H^+, (c) N^+ and (d) NH^+ ion exits from N_2^+/Pt(H) as a function of the N_2^+ incidence energy, in a background of 3×10^{-8} Torr H_2. (e) Peak exit energies of N_2^+, N_2H^+, N^+ and NH^+ as a function of N_2^+ incident energy. The solid lines are linear fittings with the slope K=0.8661 from calculated kinematic factor for N_2^+ scattering on Pt.

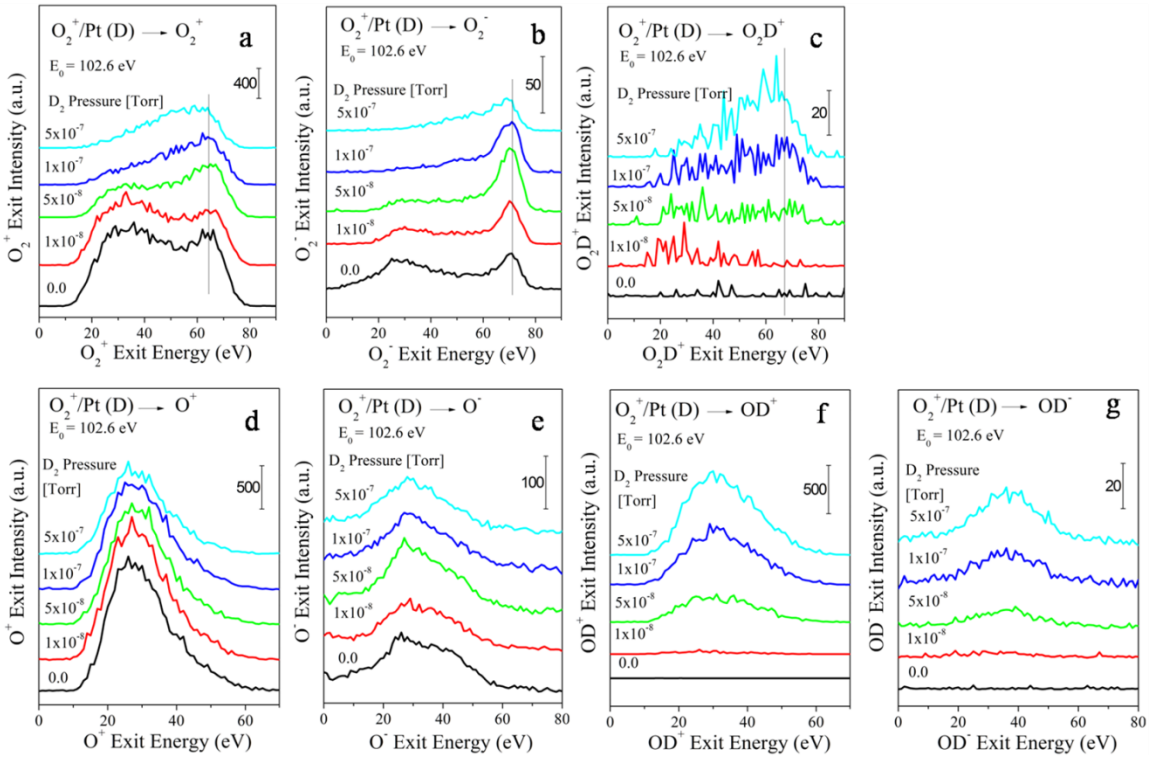

Figure S6. Energy distributions for: (a) O_2^+, (b) O_2^-, (c) O_2D^+, (d) O^+, (e) O^-, (f) OD^+ and (g) OD^- ion exits from O_2^+/Pt(D) at E_0=102.6 eV at various D_2 exposure pressures.

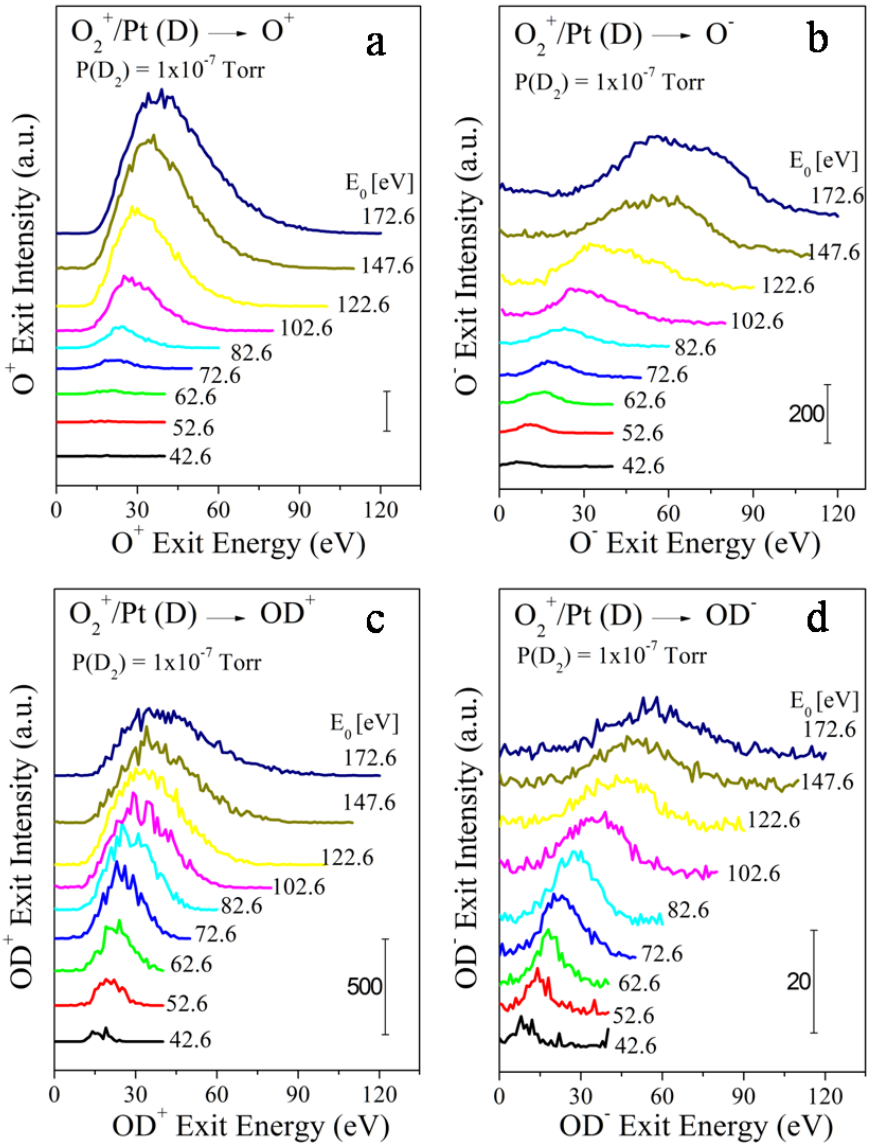

Figure S7. Energy distributions for: (a) O^+, (b) O^-, (c) OD^+ and (d) OD^- ion exits from O_2^+/Pt(D) as a function of the O_2^+ incidence energy, in a background of 1×10^{-7} Torr D_2.